



Special Operations Forces Industry Conference

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SIGINT/Cyber Future Environment

The background is a collage of four images: a missile on the left, a sensor or camera unit in the center, a soldier in the bottom right, and a radio antenna in the middle right.

**Special Reconnaissance
Surveillance and Exploitation**

Technology Areas of Interest

- Improved Direction Finding (DF) And Geo-location (GEO) Antenna Arrays (Airborne / Maritime / Mobile / Body worn)
- Networked Tactical SIGINT Systems
- Lightweight, Adaptable Tactical SIGINT Systems
- Exploit Modern Communication Systems
- Data Discovery And Enrichment In Support Of Intel Analysis
- Advanced Data Management Systems
- Network Multi-Level / Cross Domain Security Services
- Full Motion Video / Motion Imagery (FMV/MI) Exploitation
- Multi-Intelligence Fusion And Correlation

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Improved DF and GEO Antenna Arrays

- Current State of The Technology
 - Bulky, Narrowband, Limited-Accuracy DF Antennas
- Ongoing Efforts
 - Phased Array and Beam-Steering Antennas; Body-Wearable DF Antennas; T/FDOA Techniques
- Where We Want to Be
 - Wideband High-Gain Antenna Systems; Flexible Multi-Platform High-Accuracy DF and GEO Antenna Systems; Body-Wearable, Concealable DF Antennas; All-Azimuth/Elevation
- Potential Game Changers
 - Phase-Coherent DF Systems; Beam-Steering Antenna Design; T/FDOA Signal Measurements

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Networked Tactical SIGINT Systems

- **Current State of The Technology**
 - Techniques for Collaborative DF And Geo-Location Operations
- **Ongoing Efforts**
 - Networking Concepts And Devices To Communicate Between Tactical SIGINT Operators
- **Where We Want to Be**
 - DF and Geo-Location of Signal Sources Using All Available Overhead, Air, Maritime And Ground SIGINT Assets
- **Potential Game Changers**
 - Lightweight VHF-UHF Mesh Networking Radios; Miniature Communications Devices; JICD 4.0 Collaborative Geo-Location Messaging; Time/Frequency Direction Of Arrival (T/FDOA) Sensors; Geo-Location Algorithms

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Lightweight, Adaptable Tactical SIGINT Systems

- **Current State of The Technology**
 - Heavy, Power-Hungry, Inflexible Products; Focused Use
- **Ongoing Efforts**
 - Reduce Equipment Size, Weight and Power (SWAP); Expand Platform Integration; Versatile HW/SW
- **Where We Want to Be**
 - Common Low-SWAP Adaptable SIGINT Equipment
- **Potential Game Changers**
 - Miniature T/FDOA-capable Receivers; Versatile Antenna “Toolkits”; Low-Profile and Body-Wearable DF Antennas; Flexible Industry-Standard Equipment Interfaces and Software Applications

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Exploit Modern Communications Systems

- **Current State of The Technology**
 - Collection, Exploitation of Current Communications Signals
- **Ongoing Efforts**
 - Develop Collection and Exploitation Techniques for New Emerging Systems
- **Where We Want to Be**
 - Worldwide Collection and Exploitation of Advanced Communications Systems
- **Potential Game Changers**
 - Advanced Signal Processing Algorithms; Demodulation and Decryption Techniques; Versatile, Wideband Tactical SIGINT Systems

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Advanced Data Management Systems

- **Current State Of The Technology**
 - Relational Data Base Management Systems (RDBMS)
 - XML Databases
 - Object-oriented Databases
- **Ongoing Efforts**
 - SIDMS
- **Where We Want To Be**
 - Enable The Effective/Efficient Management Of Unstructured Data
 - A Distributed Data Management System That Reduces The Overhead And Complexity Of Current RDBMS.
- **Potential Game Changers**
 - Advanced XML Databases At A Maturity Level Of RDBMS

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Network Multi-Level Security/Cross Domain Security Services

- **Current State Of The Technology**
 - Cross Domain Solutions Are Complex, High In Cost, And Lack Operational Flexibility In Addressing User Needs
- **Ongoing Efforts**
 - Evaluating Solutions –E.G., Trusted Virtual Environment (TVE)
- **Where We Want To Be**
 - Enable SOF Users To Exchange Information, Collaborate On-Demand, And Utilize SOF Required Applications Between Security Domains
- **Potential Game Changers**
 - Certified/Accredited Classification Labels To Unstructured Data Types
 - Flexible And Robust Algorithms That Enable Current Cross Domain Guards To Support Complex Data Types

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Full Motion Video (FMV) Exploitation

- **Current State of The Technology**
 - Human Analysis, Few Automated Tools
- **Ongoing Efforts (Research)**
 - Content/Semantic Based Search Capabilities
 - Change /Activity/Object Detection Within FMV Files To Support Video Processing, Exploitation, Dissemination (PED) Processes
- **Where We Want to Be**
 - Enable Detection of Objects and Activities Of Interest Within Real-Time and Archival Video
- **Potential Game Changers**
 - Object/Activity Auto-Tagging In High Definition Video

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Multi-Intelligence Fusion And Correlation

- Current State of The Technology
 - Multi-INT Data Collections Using Single-INT Stove-Piped Systems And Processes—Limited Post-collection Fusion
- Ongoing Efforts
 - MASINT Tactical Information Fusion (MASTIF) ACTD
- Where We Want To Be
 - Improve Target Geo-Location/Identification Accuracy, Confidence And Speed
 - Enable Cross Cueing Of Intelligence, Surveillance, And Reconnaissance (ISR) Collection Assets
- Potential Game Changers
 - Automated, Real-Time Detection, Identification, And Geo-location Of Target Of Interest, Auto-Project/ Predict Movements

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Questions?

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